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Indian Standard

CODE OF PRACTICE FOR CALIBRATION OF VEHICLE TANKS FOR PETROLEUM PRODUCTS AND OTHER LIQUIDS

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CODE OF PRACTICE FOR CALIBRATION OF VEHICLE TANKS FOR PETROLEUM PRODUCTS AND OTHER LIQUIDS

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Indian Standard

CODE OF PRACTICE FOR CALIBRATION OF VEHICLE TANKS FOR PETROLEUM PRODUCTS AND OTHER LIQUIDS

0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 9 May 1963, after the draft finalized by the Commercial Weights and Measures Sectional Committee had been approved by the Engineering Division Council.

0.2 The object of this standard is to have uniformity in calibrating the vehicle tanks for petroleum products and other liquids.

0.3 The views of producers, consumers and technologists have been taken into consideration in the preparation of this code of practice.

0.4 Wherever a reference to any Indian Standard appears in this code of practice, it shall be taken as a reference to the latest version of the standard.

0.5 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960 Rules for Rounding Off Numerical Values (*Revised*). The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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1. SCOPE

1.1 This standard covers recommendations for the calibration of vehicle tanks which are used for transport of petroleum products and other liquids.

2. TERMINOLOGY

2.0 For the purpose of this standard, the following definitions shall apply.

2.1 Vehicle Tank — An assembly used for measurement and delivery of liquids, comprising a tank, which may or may not be divided into compartments, mounted on a vehicle together with its necessary piping, valves, meters, etc.

2.2 Calibration — The verification and stamping of the capacity of vehicle tank or its compartments.

2.3 Compartment — The entire tank when this is not sub-divided, otherwise any one of the sub-divisions of the tank designed to hold liquid.

2.4 Dip Stick — A square or rectangular metal bar of brass or other suitable hard material, used to determine the depth of the liquid in the tank.

2.5 Proof Level — Reference level to which all depth measurements shall be related.

2.6 Ullage Indicator — A device bolted to the inside of a man-hole neck ring with the indicator set to any desired level to which liquid in the tank is required to be filled.

2.7 Ullage Stick — A T-shaped metal bar, of brass or other suitable material, used to determine the depth of the level of liquid from the proof level.

2.8 Dip Pipe — A pipe rigidly attached at the top of the tank extending vertically downward up to approximately 15 cm from the bottom of the tank. The pipe shall have perforations at the top above the maximum liquid level.

3. EQUIPMENT AND TOOLS

3.1 The following equipment and tools are required for calibration of vehicle tanks:

a) *Proving measures* — when available, shall be checked for accuracy against an appropriate working standard measure [*see* IS : 2341-1963 Specification for Large Metric Capacity Calibrating Measures (Non-Tilting Type)].

b) *Calibrated bulk meter* — An accurate meter fitted with a pre-set valve, air eliminator and strainer, which has been checked for accuracy against an appropriate working standard measure.

c) *A set of commercial measures* — [*see* IS : 1058-1962 Specification for Commercial Metric Capacity Measures (*Revised*)].

d) *Other equipment and tools, namely, scriber, punch, try square, tyre pressure gauge, hammer, etc.*

4. TESTING MEDIUM

4.1 Compartment Testing — Water or other appropriate liquid shall be used as a testing medium in determining the capacity of a vehicle tank compartment.

4.2 Meter Testing — A vehicle tank meter shall be tested with a liquid of the same character or of approximately the same viscosity as the liquid to be commercially measured through the meter.

5. CALIBRATION PROCEDURE

5.1 Vehicle tanks used as measures shall be calibrated as capacity measures. In the case of meter equipped tanks, the meter shall be treated as a separate measuring instrument for the purpose of calibration.

5.2 The compartment capacity or capacities shall be construed as including the capacities of the delivery lines leading from the emergency, safety or master valve to the outlet valve (discharge valve), provided that in the case of vehicle compartments terminating in a single delivery pipe-line fitted with an outlet valve, the compartment capacity or capacities shall be taken as excluding the capacity of the delivery pipe-line. A notice shall be prominently exhibited on the vehicle tank indicating clearly and indelibly one of the following, as appropriate:

' Marked capacity includes capacity of delivery pipe-line. '

OR

' Marked capacity excludes capacity of delivery pipe-line. '

5.2.1 The safety or master valve shall be positioned at the lowest point of the outlet from the compartment.

5.3 The proving measure or bulk meter shall be mounted on an overhead gantry or a separate framework in a convenient position above a firm and level platform preferably of concrete on which the vehicle stands during calibration.

5.4 The vehicle shall be placed in a level position before commencing calibration as accuracy of calibration depends on the level of the tank; the sequence in which compartments are calibrated should be such as to minimize unequal spring deflection on the axles of vehicle.

5.5 The front and rear tyres of the vehicle should be at the correct pressure. The tyres should be inspected for wear which should be reasonably even and there should not be excessive difference in wear between the front set and rear set of tyres at the time of calibration.

5.6 The interior of compartment or compartments shall be inspected and cleaned where necessary.

5.7 Before starting calibration, the pipe-lines, outlet valves and other connections shall be tested against leakage by partially filling and draining each compartment in turn through the outlet valve. During the process, sufficient quantity of the testing medium shall be introduced in the compartments to wet the internal surfaces of the compartments and pipe-lines.

5.8 After taking the precautions mentioned in **5.3** to **5.7**, the compartment to be calibrated shall be filled with proving measures or bulk meters to the marked capacity of the compartment of the delivery lines leading to the outlet valve full or empty as provided in **5.2**. The dip mark or ullage mark shall be taken carefully and the line shall be cut on the dip stick or ullage stick at right angles to the axis with the help of try square and scriber. If an ullage indicator is used, it shall be correctly set and sealed.

5.9 A mark shall also be made on the dip stick to indicate the 'proof level'. In the case of ullage stick, the distance from the ullage point to the T-joint shall be marked on the stick.

NOTE — The sequence for calibrating compartments should be the sequence of filling them. The sequence of discharge shall be in the reverse order to that of filling.

6. CAPACITIES AND PERMISSIBLE ERRORS

6.1 Proving measures shall have the following capacities and shall be adjusted within the following permissible errors:

Capacity litres	*Permissible Error* millilitres (plus or minus)
50	50
100	100
200	200
500	500
1 000	1 000
1 500	1 500
2 000	2 000
5 000	5 000

6.2 The permissible error for compartments shall not exceed 0·05 percent of the marked capacity.

7. MARKING

7.1 The vehicle shall have a brass plate riveted in a prominent position on it to receive the inspector's stamps. The brass plate shall bear the following particulars:

a) Title of weights and measures act;
b) Name of the owner of the vehicle; and
c) Vehicle registration number, and the serial number and capacity of each compartment.

7.1.1 Space shall be provided on the plate for inspector's stamps.

7.2 The capacity of the compartment shall be indelibly marked on the man-hole cover and also painted on each side of the compartment so that it is clearly visible. If there is more than one compartment, then each compartment shall have its capacity marked separately in this manner and the compartments numbered serially. The number of the compartments shall also be marked on the discharge valve pertaining to the compartment.

7.3 The vehicle registration number as well as the capacity of the compartment shall be indelibly marked on the dip stick or ullage stick at the top end. If there is more than one compartment, the different faces of one dip stick may be used for markings and each face shall bear the vehicle number, the serial number of the compartment, the proof level and dip line of the compartment, and the capacity of the compartment.